



January 2012

Job Satisfaction And Professional Employees' Perceptions Of Ict Use

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JOB SATISFACTION AND PROFESSIONAL EMPLOYEES' PERCEPTIONS OF ICT
USE

by

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Bachelor of Arts, University of North Dakota, 2008

A Thesis
Submitted to the Graduate Faculty

of the

University of North Dakota

In partial fulfillment of the requirements

for the degree of

Master of Arts

Grand Forks, North Dakota

July
2012

This thesis, submitted by Cody Asperheim in partial fulfillment of the requirements for the Degree of Master of Arts from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.

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Wayne Swisher
Dean of the Graduate School

July 10, 2012

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Degree Master of Arts

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July 10, 2012

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ABSTRACT

Using data from the Pew Internet & American Life Project's 2008 Networked Workers Survey (N = 306), this study evaluates the relationship between professional employees' perceptions of information and communications technology (ICT) use and job satisfaction. The differential salience approach guides this research by highlighting the importance of resources and demands to employees' experiences at work. Descriptive statistics reveal that professional employees perceive ICT as both a resource and demand. Bivariate correlations and OLS regression demonstrate a statistically significant association between job satisfaction and ICT as a resource and demand. ICT as a resource is positively associated with job satisfaction while ICT as a demand is negatively associated with job satisfaction. Implications, limitations, and suggestions for future areas of research are discussed.

CHAPTER I
INTRODUCTION

This thesis examines the relationship between perceptions of information and communications technology (ICT) among professional workers and job satisfaction. We live in an age in which ICT plays a fundamental role in people's personal lives and professional careers. In an ongoing project by the Pew Research Center (2000 – present), researchers found that 93% of American employees own cell phones, a rate 15% higher than the country's adult average (Madden & Jones, 2008b). Furthermore, 62% of American employees report using the Internet or e-mail at their jobs (Madden & Jones, 2008b). In another study conducted by National Public Radio, the Kaiser Family Foundation, and Harvard's Kennedy School of Government (National Public Radio Online, 1999), results indicated that the vast majority of Americans (84%) believe that computers are vital for their occupations. Specifically, among professional employees, 80.5% use computers at work. Compared to those in other occupations, professional employees are the most active users of ICT (Victory & Cooper, 2002). Finally, 88% of professional workers believe technologies, such as laptops and cellphones, lead to increased productivity (WorldOne Research, 2009). This evidence suggests that many of the common forms of ICT are being utilized as workplace resources by professional employees.

But while ICT may act as a valuable workplace resource, to some, the demands it presents can become overwhelming and may possibly reduce job satisfaction. Having a

constant connection to technology may bring unwanted activity and intrusion into workers' lives. For instance, roughly a third of cellphone owners (29%) turn off their phones for periods of time just to get a break from using them (Smith, 2011). Because of the efficient nature of computers, the Internet, e-mail, and cellphones, employees are encouraged to engage in multitasking. Workplace multitasking can then lead to interference with employee focus and a decline in job efficiency (Korkki, 2011; Zimmerman, 2011). Many employers are also utilizing ICT because it can be used by workers who are off the clock and physically distanced from the workplace (Greene, 2009; Mandel, Hamm, Matlack, Farrell, & Palmer, 2005). A prime example of employees fighting this strategy to expand the demands of work was recently displayed. At the end of 2011, labor representatives from the German automaker Volkswagen convinced executives to enforce an agreement that e-mails sent by company phones could only be delivered a half hour before to a half hour after regular working hours (Cohen, 2012; Reuters, 2011). This decision is one of the first of its kind enacted by a Fortune 500 company. Furthermore, professional employees all across Germany may soon experience similar policy changes due to the proposal of an initiative that would curb work-related e-mail and cellphone use after work hours in order to protect the personal time of employees (Global Toronto, 2012). Ultimately, however, policies like this remain uncommon as employers seek to maximize profit and worker efficiency by further utilization of ICT. Given the important role played by job satisfaction in shaping employee performance, productivity, turnover, and retention (Cotton & Tuttle, 1986; Danziger & Dunkle, 2005), the question that this thesis asks is whether professional employees' perceptions of ICT use shape their job satisfaction.

ICT creates changes in the workplace that social scientists are still attempting to understand. Given that the various forms of ICT may act as both a resource and demand in professional workplaces, the purpose of this study is to examine the potential relationship between perceptions of ICT use and job satisfaction. In other words, do professional employees perceive ICT as a resource or as a demand, and does this significantly help, hurt, or have little influence on job satisfaction? This question has been largely ignored in the social sciences and it is the aim of this study to help fill this gap in the literature.

Four forms of ICT will be considered in this study: professional workers' perceptions of using computers, the Internet, e-mail, and cellphones. This study focuses on professional employees primarily because of their high rate of regular ICT use (Madden & Jones, 2008b). Professional workers also have a high rate of ICT acceptance, and their ICT use is constantly increasing (Kakihara & Sørensen, 2002). Among the most important reasons for such widespread use and acceptance of ICT in the professional workforce is the high level of education demanded of professional employees (Losh, 2009). In contrast to professional positions, in certain areas of the workforce, such as the service industry, education and the use of ICT is often less integral to the nature of the work. Rates of turnover in these sectors also tend to be much higher. Thus, employers often do not spend the time and resources necessary to supply and train non-professional workers with ICT (Losh, 2009).

In addition to using ICT more frequently, professional employees also generally work the longest hours (Roberts, 2007). A 2009 study commissioned by LexisNexis found that employees spent an average of 15 hours per day using ICT applications, effectively doubling the standard 8-hour workday. Furthermore, nearly half (42%) of professionals admit to feeling the demand to be connected to the workplace on a 24 hours a day/7 days per week

basis (Hilpert, 2010). Yet, little research has been conducted on the relationship between perceptions of ICT use and professionals' job satisfaction. With the rise of immediate and constant access to ICT, professionals' job satisfaction may be affected. Whether perceptions of ICT use have positive or negative effects on job satisfaction is what this thesis aims to discover.

To examine the linkage between perceptions of ICT and job satisfaction, the differential salience model will be used as a theoretical framework. This approach calls attention to the roles played by demands and resources in the workplace and questions which are more salient for outcomes, such as job satisfaction. In the following chapter, two hypotheses will be developed based on information in the current social science literature. One hypothesis will predict a positive association between perceptions of ICT as a resource and professional workers' job satisfaction. In contrast, the second hypothesis will predict a negative association between perceptions of ICT as a workplace demand and professional workers' job satisfaction. Data taken from self-identified professional workers are used to test the study hypotheses. This dataset comes from the 2008 Networked Workers Survey sponsored by The Pew Internet & American Life Project (Madden & Jones, 2008a).

Organization of the Thesis

Chapter Two begins with an overview of Voydanoff's (2004a, 2004b) theory of differential salience and a review of existing literature. In the methodology chapter (Chapter Three), the analytic strategy used in this study as well as The Pew Internet & American Life Project's 2008 Networked Workers Survey, this study's data source, will be described. The results chapter (Chapter Four) will include the analysis of data and statistical findings concerning professional workers' perceptions of ICT use and job satisfaction. Finally, this

thesis will conclude with the discussion chapter (Chapter Five), focusing on the study findings, implications, limitations, and suggestions for future research.

CHAPTER II

LITERATURE REVIEW

Understanding relevant work in the existing body of social science literature is crucial to the guidance of the current study. This chapter begins with an overview of Voydanoff's (2004a, 2004b) differential salience approach, this study's primary theoretical framework. Literature relevant to the dependent variable, job satisfaction, will then be covered along with literature and hypotheses pertaining to how ICT may act as both a work resource and a work demand. Following this discussion, the control variables for the study will be introduced.

Theoretical Approach

Building on the work of Patricia Voydanoff (2004a, 2004b), this study utilizes the differential salience approach to examine the relationship between employees' perceptions of work-related information and communications technology (ICT) among professional workers and job satisfaction. Voydanoff proposed that employees experience various demands and have access to resources in their workplaces. These demands and resources may ultimately affect work-related outcomes. Work demands "are structural or psychological claims associated with role requirements, expectations, and norms to which individuals must respond or adapt by exerting physical or mental effort" (Voydanoff, 2004a, p. 275). Demands range from the hours employees must work to the pressure they receive from superiors to get tasks done. Resources are defined as "structural or psychological assets that may be used to facilitate performance, reduce demands, or generate additional resources" (Voydanoff,

2004a, p. 275). Resources basically make work easier for employees and include things like salary, a supportive work environment, or access to helpful work skills and tools.

While Voydanoff (2004a, 2004b) focused on demands and resources associated with work-family conflict, it is also likely that they influence professional employees' feelings of job satisfaction. Indeed, research has shown that work demands frequently produce work-family conflict, which is strongly associated with lower rates of job satisfaction (Bos, Donders, Bouwman-Brouwer, & Van der Gulden, 2009; Bruck, Allen, & Spector, 2002). This contrasts with work resources, which have been found to be associated with positive experiences, such as work-family facilitation. In turn, work-family facilitation has been linked to higher ratings of job satisfaction (Bos et al., 2009). Work-family conflict and work-family facilitation are important variables to consider, however, this study instead uses Voydanoff's differential salience approach to explore job satisfaction.

A differential salience approach offers insight into how ICT can have both a positive *and* negative influence rather than a positive *or* negative influence on various outcomes, including job satisfaction. Because computers and other forms of ICT have the potential to act as demands and resources, the same technology may have differential salience in terms of imposing conflict or facilitating support. Thus, the same form of technology may differentially impact job satisfaction. For example, if a professional worker has access to computers in the office, work may be able to be completed more quickly. Yet because of their presence, additional work may also be added to an employee's duties to fill up newly freed time, introducing a demand. For this reason, and based on the differential salience approach, two different hypotheses pertaining to professionals' perceptions of workplace ICT use as a resource and as a demand will be proposed for the current study. These hypotheses

will be presented in the next section of this chapter, which reviews literature relevant to the study background.

The literature reviewed in this chapter focuses largely on the relationship between ICT use and job satisfaction; however, the focus of this thesis is professional workers' subjective perceptions of ICT use. By focusing on perceptions of ICT as both a workplace resource and demand, the current study makes a contribution to the larger body of existing social science research that primarily considers objective measures. The consideration of ICT as both a resource and demand allows for a more refined analysis of how ICT and job satisfaction are linked among professional workers.

Background

Job Satisfaction

As the dependent variable of this study, job satisfaction can be defined as “the extent to which people like (satisfaction) or dislike (dissatisfaction) their jobs” (Spector, 1997, p. 2). Researchers, including Freund (2005) and Tett and Meyer (1993), have found job satisfaction to be a major precursor to voluntary withdrawal from an occupation; people who do not like their jobs often find new ones. Aside from a direct relationship with turnover and retention rates (Cotton & Tuttle, 1986), job satisfaction has also been linked to job performance and productivity (Danziger & Dunkle, 2005).

The study of job satisfaction has been largely divided into two categories; factors associated with the job and factors associated with the individual (Spector, 1997). In regard to factors associated with the job, early work by Herzberg (1966), for instance, elucidated five primary factors associated with job satisfaction: opportunities for achievement, recognition, advancement, responsibility, and the work itself. Factors associated with the

individual include personality traits, such as outlook on work, locus of control, and negative affectivity (Spector, 1997). Building on Herzberg's work, other researchers have shown that job satisfaction among professional workers is also related to feelings of meaningfulness, responsibility, and knowledge of results. These are impacted by work characteristics such as skill variety, task significance, task identity, autonomy, and feedback (Hackman & Oldham, 1976). Another correlate of job satisfaction, person-job fit, combines job and individual factors; it occurs when work characteristics match characteristics of the individual worker (Edwards, 2008).

Professional employees often perceive their jobs as quite satisfying (Smith, 2007). Prestige and income are two reasons this may be the case; employees with lower prestige and lower income jobs often report less job satisfaction (Smith, 2007). Furthermore, ICT professionals (technicians, support, trainers, etc.) have been found to report lower levels of job satisfaction as the result of low job security, involvement, and sense of achievement (Scotsman, 2007).

Despite the many directions of past job satisfaction research, little work to date has been done to understand whether professional employees' perceptions of ICT are associated with job satisfaction. When selecting a job, professional employees often consider factors that can be conceptualized as resources and demands. These same predictors of job choice influence job satisfaction and include things such as salary, job security, hours that must be worked per week, opportunities for promotion, time to complete tasks, task clarity and significance, ability to utilize skills, autonomy, job involvement, responsibility, identification with an organization, and the ability to work in an information-rich environment (Caroli, Greenan, & Guellec, 2001; Colombier, Martin, & Pénard, 2007; Danziger & Dunkle, 2005;

Piazza, 2007; Ting, 1996). If employees are comfortable with the resources and demands they face in the workplace, reports of job satisfaction are likely to be high (Society for Human Resource Management, 2009).

Because ICT contributes to workplace productivity (Black & Lynch, 2001) and may make work easier to complete, the perception of ICT as a resource is likely to be positively associated with job satisfaction. However, the likelihood that ICT use adds to workload and employee stress should also be considered. When perceived as a demand, ICT use may also be negatively associated with job satisfaction. Employee perceptions of ICT as both a resource and a demand have been largely ignored in the literature on job satisfaction. The roles of ICT among professional workers as a resource and demand will be explored in the following sections of this chapter.

ICT as a Workplace Resource

For professional workers, technologies, such as computers, e-mail, cellphones, and the Internet, do carry positive benefits. After all, the practical purpose of technology is to act as a resource for users. Researchers have found that ICT use in the workplace improves aspects of employees' work and can increase job satisfaction if ICT systems are abundant and reliable (Colombier et al., 2007; Danziger & Dunkle, 2005). For example, if professional employees have access to such technologies, stress can be reduced by utilization of up-to-date stable systems through which information to get work done can be acquired quickly and easily. The availability of ICT can also reward workers by helping them become more autonomous (Colombier et al., 2007).

Communication through e-mail, for instance, has shown itself to be an important workplace resource. This is especially true within many professional occupations due largely

to e-mail's ability to act as a medium for instant communication between employees or with employers despite possible differences in physical location. In recent years, e-mail has proven itself to be the most important form of computerized communication in the workplace (Dabbish & Kraut, 2006). Unfortunately, there is surprisingly little research that has focused directly on either perceptions or actual use of workplace e-mail and job satisfaction, despite the fact that e-mail use has dramatically increased in recent years. One exception is a 2005 dissertation in which Recascino examined job satisfaction and its association with e-mail use within a university workplace. No significant difference in job satisfaction was found between those who often used e-mail and those who did not; therefore, whereas e-mail use did not appear to be perceived as a significant workplace resource it also did not act as a significant workplace demand.

Use of the Internet at work may also act as a workplace resource with implications for professional workers' job satisfaction. For instance, by engaging in "cyberslacking," employees can go online and take small breaks from stressors at work, relieve boredom, or find other creative outlets (Eastin, Glynn, & Griffiths, 2007; Messarra, Karkoulian, & McCarthy, 2011; Stanton, 2002). The idea of slacking in the workplace may bring to mind the possibility of negative outcomes for a business, but cyberslacking can act as a resource for professional employees and has been found to be associated with increased job satisfaction (Messarra et al., 2011). In addition, the Internet can be a gateway to nearly unlimited information. Gathering, storing, and processing information and facilitating new forms of communication can all be enhanced through use of the Internet.

Lastly, cell phones may also act as a resource, ultimately leading to increased job satisfaction (Colombier et al., 2007). As a resource, cellphones began as a means of opening

up mobile lines of communication between individuals. Today, however, using a cellphone to talk to someone is only one of its many possible utilities. Text messaging, e-mail, web browsing, taking pictures and video, and many other applications make cellphones a diverse workplace resource important to many forms of professional work. Cellphones may even act as a psychological resource. This is possible when they are perceived as signs of responsibility and recognition from employers (Colombier et al., 2007).

Overall, it is clear that ICT in the workplace may act as a predictor of increased job satisfaction. Whereas the reviewed literature focuses more on objective measures of ICT use, this thesis focuses on perceptions of ICT use and job satisfaction as subjective measures. Because the same form of ICT use may act as both a workplace resource and demand, it is important to consider how employees perceive ICT. This allows researchers to examine different processes and outcomes related to the same form of ICT. In other words, objective measures of ICT use may mask differences that subjective measures may help to make clear. Although subjective perceptions of ICT use are largely absent in the social science literature, especially literature focusing on professional employees, the review above still suggests how ICT may be valued as a resource. Based on this information, the first hypothesis for this current study is proposed.

Hypothesis 1: When perceived as a workplace resource, ICT will be positively associated with job satisfaction for professional workers.

ICT as a Workplace Demand

Though individuals use various forms of ICT for positive purposes, ICT may also act as a workplace demand, and as a result, negative consequences may appear with its use. Some authors have found that in occupations where employees spend a great amount of time

using information and communications technology, significantly low levels of job satisfaction are reported as a result of outcomes associated with ICT use. These include work exhaustion, high levels of job pressure, and interruptions into personal life (Danziger & Dunkle, 2005; Harris, Marett, & Harris, 2011; Kim & Wright, 2007).

For those who spend a great amount of time working on computers, a negative relationship between job satisfaction and number of hours worked per week has been established (Colombier et al., 2007; Danziger & Dunkle, 2005). This negative association is believed to be the result of monotonous or repetitive work, and an emphasis on person-to-computer rather than person-to-person interaction in the workplace (Colombier et al., 2007; Danziger & Dunkle, 2005). Since professional employees commonly use computers and tend to work the longest hours relative to other occupations (Roberts, 2007), computer use is likely to be viewed as a demand and may be negatively associated with job satisfaction. Another explanation involves employees' time spent on computer-related work during personal time. The use of computers for work-related reasons during non-work time can make balancing work and personal life difficult (Cooper & Kurland, 2002). This may be a common situation for professional workers, and in turn, may reduce levels of job satisfaction (Bos et al., 2009).

Pressure to stay in touch with work-related tasks may also manifest itself in the form of e-mail communication. The demands of work-related e-mail have increased for professional employees and result in several negative consequences. Moser, Preising, Göritz, and Paul (2002), for example, identified e-mail overload as being significantly associated with lower levels of job satisfaction. This result was confirmed more recently in a 2010 study by Merten and Gloor, who focused on a sample of professional employees. The sheer volume

of e-mail messages brings with it both useful and useless information, while the use of e-mail itself can cause inefficient workflow, and even reduce the quality of communication between workers (Soucek & Moser, 2010). Furthermore, procrastinating or unproductive workers may use company e-mail inefficiently or for personal reasons, which can reduce productivity (Phillips & Reddie, 2007). When productivity is low, job satisfaction has been found to decrease as well (Argyle, 1989).

Similar to e-mail, work-related cellphones also carry a host of demands. Some studies have indicated that cellphone use for work purposes is associated with personal distress (Chesley, 2005; Colombier et al., 2007). This may be explained in part by the mobile and active nature of cellphones. Individuals do not need to go out of their way in order to sit down, boot up, and log on to their devices (Chesley, 2005). Utilized by companies to keep in touch with employees or clients, sometimes on a constant basis, the demands associated with work-related cellphones can result in the fusing of boundaries between work and family (Chesley, 2005), and an accelerated pace of life for individuals (Chesley, 2009). Researchers have found that the stressful demands cellphones can create for professional workers also stem from other issues, such as having to handle decisions on short notice with little or no help from others or the perception that cellphones are used by superiors to pressure employees or monitor their activities (Colombier et al., 2007). With the range of demands cellphones may expose workers to, it must be noted that occupation and job setting do matter (Chesley, 2006). Professional employees are particularly at risk for experiencing such demands, as they have the highest rate of cellphone ownership (Madden & Jones, 2008b). Thus, it appears likely that the demands related to cellphones may be particularly salient for professional employees.

Finally, although some research has shown that Internet use in the workplace is not directly associated with job satisfaction (Colombier et al., 2007) or that it is positively associated with job satisfaction (Eastin et al., 2007; Stanton, 2002), there is also reason to believe that Internet use may act as a work demand which can then reduce job satisfaction. As the most frequently adopted form of ICT technology (Chesley, 2006), Internet-based technologies and applications can lower job satisfaction if company surveillance measures are present or access to certain websites is blocked (De Lara, Tacoronte, & Ding, 2006). This can impede employees' ability to gather or process important information or utilize the Internet as a resource, which may lead professional employees to view it as a workplace demand.

Much like the reviewed literature associated with ICT as a workplace resource, the information reviewed in regard to ICT as a workplace demand is largely based on objective measures. The use of subjective perceptions in this thesis may be able to provide a clearer picture of how ICT can act as both a resource and demand rather than strictly a resource or demand. The literature reviewed above suggests another important direction for this thesis:

Hypothesis 2: When perceived as a workplace demand, ICT will be negatively associated with job satisfaction for professional workers.

Control Variables

The focus of this study is on the ability of ICT to act as both a resource and demand shaping the job satisfaction of professional workers. It is also important to consider control variables that have been shown to be associated with job satisfaction. The first of these variables that will be included in the current study is *sex*. This variable is included because women have been found to have higher levels of job satisfaction than their male counterparts

(Gazioglu & Tansel, 2006; Scott, Swartzel, & Taylor, 2005). *Marital status* has also been found to have an impact on job satisfaction with single employees having higher levels of job satisfaction than married employees (Gazioglu & Tansel, 2006). *Parental status* may also be associated with job satisfaction, given that mothers have been found to report higher levels than women without children, whereas fathers report lower levels than men without children (Roxburgh, 1999). Another variable that will be considered is *age*. Here a positive association has been found between age and job satisfaction (Ang, Goh, & Koh, 1993; Lee & Wilbur, 1985). For *race*, mixed results were found in the literature with some research pointing to minorities having lower reported levels of job satisfaction than whites (Seifert & Umbach, 2008), while others have found that white employees had lower levels of job satisfaction than those of other races (Scott et al., 2005). *Education* and *income* will also be considered in this current study due to their positive relationships with job satisfaction (Albert & Davia, 2005). *Hours worked per week* will be included due to its negative relationship with job satisfaction (Colombier et al., 2007; Danziger & Dunkle, 2005). This is especially pertinent due to the significantly long hours professional employees tend to work (Madden & Jones, 2008b). Finally, *self-employment* will be controlled for due to its positive association with job satisfaction (Hyytinen & Ruuskanen, 2007).

In addition to the previously discussed demographic variables, the following control variables will also be included in this study: *frequency of computer use*, *frequency of work e-mail use*, *frequency of work text messaging*, and *frequency of ICT use outside of work*. Because perceptions of ICT as either a resource or demand may vary on the basis of frequency of use, these are important factors to consider.

Summary

In this chapter, Voydanoff's (2004a, 2004b) differential salience theory was reviewed along with relevant literature on job satisfaction and workplace resources and demands related to ICT use by professional workers. Study hypotheses were then presented. This was followed by the presentation of control variables.

In the next chapter (Chapter Three), an overview of this study's data source will be addressed. The variables included from this survey will also be explained along with an outline of the analytic methods used to test the study hypotheses.

CHAPTER III

METHODOLOGY

This chapter addresses the method used to test the relationship between job satisfaction and professional employees' perceptions of ICT. Specifically, this chapter reviews the survey, the sample, and the operationalization of key variables. This chapter then concludes with a description of the analytic technique used to test the study hypotheses.

Survey and Sample

Data for this study was taken from the Networked Workers Survey sponsored by The Pew Internet & American Life Project (Madden & Jones, 2008a). Conducted in 2008 by Princeton Survey Research Associates International, this survey contains data from a nationally representative sample of 1,000 American full and part-time workers. The survey itself includes 33 questions and several other sub-questions related to how employees use ICT in the workplace as well as their attitudes regarding the benefits and drawbacks of ICT use. Using the random digit dialing method, telephone interviews were conducted to gather quantitative information. The final response rate for the survey was 24% (Madden & Jones, 2008b). Of the sample of 1,000, a total of 306 self-identified professional workers who used either laptop or desktop computers in the workplace are the focus of this study. This categorization of professional workers was composed of many occupations including, but not

limited to, lawyers, doctors, teachers, nurses, accountants, managers, officials, and business executives.

Measures

Dependent Variable

Job satisfaction. To measure the dependent variable *job satisfaction*, respondents were asked the following question: “Now thinking about your job overall, would you say you are completely satisfied with your job overall, mostly satisfied, mostly dissatisfied, or completely dissatisfied?” These responses were reverse coded and ranged from 1 (completely dissatisfied) to 4 (completely satisfied).

Independent Variables

ICT as a resource. The measurement of *ICT as a resource* included the combination of three questions: “How much, if at all, have technologies such as internet, email, cell phones, instant messaging: a) Improved your ability to do your job?, b) Allowed you more flexibility in the hours you work?, and c) Improved your ability to share your ideas with co-workers?” Responses for each of these questions were reverse coded into (1) not at all, (2) only a little, (3) some, and (4) a lot. If a respondent answered 1 to each question, the combined total of 3 would indicate that ICT was not perceived as a resource. On the other end of the scale, a combined response of 12 would indicate the maximum score for ICT as a resource. The alpha reliability coefficient for this variable was .66 for professional employees.

ICT as a demand. To measure *ICT as a demand*, three questions were combined into an index. The questions included the following: “How much, if at all, have technologies such as internet, email, cell phones, instant messaging: a) Increased the demands that you work

more hours?, b) Increased stress in your job?, and c) Made it harder for you to focus at work?” Responses for each of these questions were reverse coded into (1) not at all, (2) only a little, (3) some, and (4) a lot. If a respondent answered 1 to each question, the combined total of 3 indicated no work-related demands as a result of ICT. On the other end of the scale, a combined response of 12 indicated the maximum amount of perceived work-related ICT demands. The alpha reliability coefficient for this variable was .70.

Control Variables

Demographic variables. Control variables for this study included dummy variables for *sex*, *marital status*, *parental status*, and *race*. The question for the variable *sex* was, “What is your sex?” (0 = female, 1 = male). For *marital status*, the question, “Are you currently married, living with a partner, divorced, separated, widowed, or have you never been married?” was recoded into a dummy variable (0 = not married, 1 = married or living with a partner). *Parental status* was measured with the following yes or no question: “Are you a parent or guardian of any children under age 18 now living in your household?” The responses were coded 0 = not parent, and 1 = parent. “What is your race?” was used to measure the variable *race* (0 = non-white, 1 = white).

The control variable *age* was also included and was measured using the question, “What is your age?” The question, “What is the last grade you completed in school?” was used to measure *education* (1 = none or grades 1-8, 2 = high school incomplete, 3 = high school graduate, 4 = technical, trade, or vocational school after high school, 5 = some college, no 4-year degree, 6 = college graduate, and 7 = post-graduate training/professional school after college). The question, “In a typical week, about how many hours do you work?” measured *hours worked per week*, and the variable *yearly income* was measured with the

question: “Last year, that is in 2007, how much was your income from your job(s), before taxes?” (1 = less than \$10,000, 2 = \$10,000 – \$20,000, 3 = \$20,000 – \$30,000, 4 = \$30,000 – \$40,000, 5 = \$40,000 – \$50,000, 6 = \$50,000 – \$75,000, 7 = \$75,000 – \$100,000, 8 = \$100,000 or more)¹. Finally, the variable *self-employed* was measured with the question, “Are you self-employed or do you work for someone else, such as a company or for the government?” Responses were coded 0 = work for someone else, and 1 = self-employed.

Frequency of computer use. The question, “How often do you use a desktop computer at work?” was used to measure *frequency of computer use*. Responses were reverse coded to include (1) never, (2) less often, (3) every few days, (4) about once a day, (5) several times a day, (6) several times an hour, and (7) constantly.

Frequency of work e-mail use. To measure how often employees used work e-mail, the question, “While you are at work, how often do you check your work email?” was used. Responses were reverse coded into (1) never, (2) less often, (3) every few days, (4) about once a day, (5) several times a day, (6) several times an hour, and (7) constantly.

Frequency of work text messaging. To measure how often employees used text messaging for work-related purposes, the question, “While you are at work, how often do you send text messages to colleagues at work?” was used. Responses were reverse coded into (1) never, (2) less often, (3) every few days, (4) about once a day, (5) several times a day, (6) several times an hour, and (7) constantly.

Frequency of ICT use outside of work. A scale ranging from 10 – 40 was created to measure the *frequency of ICT use outside of work*. Respondents were asked, “Do you check your work-related e-mail” and “How often do you make or receive telephone calls related to

¹ Although these categories are not mutually exclusive, this is the exact phrasing used in the Pew Internet & American Life Project’s 2008 Networked Workers Survey.

work,” a) on weekends, b) on vacations, c) before you go to work for the day, d) after you leave work for the day, and e) when you are sick and cannot go to work. Responses included (1) never, (2) rarely, (3) sometimes, and (4) often. Answering 1 to each of the 10 conditions would result in a score of 10, the lowest possible outcome for *frequency of ICT use outside of work*. Answering 4 to each condition would result in the highest possible measure for *frequency of ICT use outside of work*, 40. The alpha reliability coefficient for this variable was .87.

Analytic Technique

Data analysis for this study will first include the use of descriptive statistics. This will be followed by bivariate correlations to measure the strength of the relationships between variables. An OLS regression model will then be generated to test the study hypotheses. The model will include both independent variables, *ICT as a resource* and *ICT as a demand*, along with each of the thirteen control variables to examine relationships with the dependent variable, *job satisfaction*. The results of these tests will be presented in the next chapter, Chapter Four.

CHAPTER IV

RESULTS

This thesis examines the association between professional employees' perceptions of ICT use in the workplace and job satisfaction. In this chapter, descriptive statistics will first be presented for the study variables. Bivariate correlations between key variables will then be presented. Finally, the OLS regression testing each of the two study hypotheses presented in Chapter Two will be reviewed.

Descriptive Statistics

Table 1 summarizes descriptive statistics for each of the variables in this study. For the demographic variables related to this sample, 62% of respondents were female and 76% were married or living with a partner. Forty-three percent of respondents were parents with children under the age of 18 living at home during the time of the survey. Furthermore, the average *age* of this sample was 45.91 years ($SD = 11.10$). Most professional employees identified themselves as white (84%). The mean score for *education* was 5.95 ($SD = 1.14$) indicating an average on the ordinal scale near "college graduate." In regard to *yearly income*, a mean score of 5.88 ($SD = 1.74$) indicates respondents earned between \$40,000 - \$50,000 and \$50,000 - \$75,000. The average for *hours worked per week* was 44.49 hours ($SD = 10.81$). Lastly, 12% of the sample identified themselves as *self-employed*.

For *frequency of computer use*, a mean score of 5.27 ($SD = 2.03$) indicates that respondents used a computer several times a day. The mean score for *frequency of work e-mail use* was 5.06 ($SD = 1.99$), also indicating respondents used this form of ICT several times a day. The mean score for *frequency of work text messaging* was much lower ($M = 1.42$, $SD = 1.13$). This indicates that most respondents never used text messaging at work to communicate with colleagues. The mean score for *frequency of ICT use outside of work* was 21.02 ($SD = 7.34$). This suggests that respondents were near the middle of the scale ranging from never using work-related ICT outside of work to constant use of work-related ICT outside of work hours.

The mean score for the independent variable, *ICT as a resource*, was 9.00 ($SD = 2.42$). This indicates on a scale ranging from 3 to 12 that on average professionals acknowledged ICT's role as a workplace resource. For the variable *ICT as a demand*, a slightly lower mean of 6.34 ($SD = 2.57$) was reported on the same scale. Thus, professional employees were more likely, on average, to perceive ICT as a resource than as a demand. Finally, for the dependent variable, *job satisfaction*, the mean score was 3.28 ($SD = .63$). This suggests that most professional employees were satisfied with their work.

Table 1: *Descriptive Statistics*

<i>Variables</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Range</i>
<u>Dependent Variable</u>				
Job satisfaction	304	3.28	.63	1 – 4
<u>Independent Variables</u>				
ICT as a resource	300	9.00	2.42	3 – 12
ICT as a demand	294	6.34	2.57	3 – 12
<u>Control Variables</u>				
Sex ^a	306	.48	.50	0 – 1
Marital status	305	.76	.43	0 – 1
Parental status	305	.43	.50	0 – 1
Age	303	45.91	11.10	21 – 73
Race ^b	306	.84	.37	0 – 1
Education	306	5.95	1.14	2 – 7
Yearly income	280	5.88	1.74	1 – 8
Hours worked per week	303	44.49	10.81	1 – 61
Self-employed	306	.12	.32	0 – 1
Frequency of computer use	306	5.27	2.03	1 – 7
Frequency of work e-mail use	306	5.06	1.99	1 – 7
Frequency of work text messaging	306	1.42	1.13	1 – 7
Frequency of ICT use outside of work	280	21.02	7.34	10 – 40

^a For the variable sex, 0 = female and 1 = male.

^b For the variable race, 0 = non-white and 1 = white.

Bivariate Correlations

As shown in Table 2, when testing the correlations between the variables in this study, *job satisfaction* was found to be negatively associated with *ICT as a work demand* ($r = -.196, p < .001$). Thus, those who reported perceiving ICT as less of a work demand also reported higher levels of job satisfaction. This was the only statistically significant association shared between any of the independent or control variables and the dependent variable.

Results for the key independent variables indicated *ICT as a resource* was positively and significantly associated with six independent or control variables. The first of these was

ICT as a demand ($r = .249, p < .001$). This association is interesting to note due to the finding that as perceptions of *ICT as a resource* increased, perceptions that ICT was a demand also increased, and vice versa. The control variables *yearly income* ($r = .235, p < .001$), *hours worked/week* ($r = .138, p < .05$), *frequency of work e-mail use* ($r = .325, p < .001$), *frequency of work text messaging* ($r = .195, p < .001$), and *ICT use outside of work* ($r = .357, p < .001$) were also positively and significantly associated with *ICT as a work resource*. As each measure for the above control variables increased, so did perceptions of *ICT as a resource* such that those who worked more hours and had higher incomes, used work e-mail and text messaging, and used ICT outside of work more frequently reported higher levels of *ICT as a resource*. For many of these control variables, significant positive associations also existed with the independent variable, *ICT as a demand*. These control variables included *education* ($r = .155, p < .01$), *yearly income* ($r = .189, p < .01$), *hours worked/week* ($r = .266, p < .001$), *frequency of work e-mail use* ($r = .153, p < .01$), and *ICT use outside of work* ($r = .362, p < .001$)

Table 2: Bivariate Correlations

Job	Correlation	Job satisfaction	ICT as a resource	ICT as a demand	Sex	Marital status	Parental status	Age	Race	Education	Income	Hours worked/week	Self-employed	Frequency of computer use	Frequency of work e-mail use	Frequency of text messaging	Frequency of using ICT outside of work
Job satisfaction	N 304																
ICT as a resource	Correlation .100 N 298	.100	1														
ICT as a demand	Correlation -.196*** N 292	-.196***	.249***	1													
Sex	Correlation .062 N 304	.029	.078	.078	1												
Marital status	Correlation .067 N 303	.001	-.061	-.061	.030	1											
Parental status	Correlation -.031 N 303	-.110	.039	.037	.173**	.035	1										
Age	Correlation .075 N 301	-.027	-.023	-.037	-.037	.066	-.377***	1									
Race	Correlation .097 N 304	-.055	-.081	.086	.086	.042	-.012	.092	1								
Education	Correlation -.020 N 304	.084	.155**	-.019	.063	.063	-.015	.104	.006	1							
Income	Correlation .115 N 278	.235***	.189**	.284***	.198***	.066	.155**	.279	.063	.337***	1						
Hours worked/week	Correlation .025 N 302	.138*	.266***	.254***	-.057	-.057	-.002	-.110	.006	.056	.322***	1					
Self-employed	Correlation .077 N 304	.000	-.074	.098	-.009	-.007	-.007	.133*	.052	.050	-.039	.072	1				
Frequency of computer use	Correlation -.012 N 304	.088	.031	.064	-.022	-.023	-.023	.033	-.011	.007	-.018	-.022	-.003	1			
Frequency of work e-mail use	Correlation -.006 N 304	.325***	.153**	.167**	.022	.084	-.119*	-.119*	.003	-.002	.196***	.203***	-.066	.164**	1		
Frequency of work text messaging	Correlation .013 N 304	.195***	.033	.041	-.054	.045	-.167**	-.116*	-.015	.099	.089	.185***	.006	-.004	.079	1	
Frequency of using ICT outside of work	Correlation .073 N 278	.357***	.362***	.104	.025	.092	-.123*	-.126*	.085	.246***	.246***	.340***	.173**	-.053	.236***	.250***	1

*p < .05. **p < .01. ***p < .001

Ordinary Least Squares Regression

A regression analysis was used to test the study hypotheses and examine which of the variables were significantly associated with the dependent variable, *job satisfaction*. In order to preserve the cases for which data were not available on all measures, means substitution was employed. With an adjusted R square value of .050 and a significant F value of 2.078 ($p < .05$), this model shows that 5.0% of the variance in *job satisfaction* can be explained by this model.

As seen in Table 3, the regression analysis suggests that perceptions of *ICT as a resource* and *ICT as a demand* are both significantly associated with *job satisfaction*. This provides support for both Hypothesis 1 and Hypothesis 2. *ICT as a resource* was positively associated with *job satisfaction* ($\beta = .131, p < .05$), whereas *ICT as a demand* was negatively associated with the dependent variable ($\beta = -.253, p < .001$). Although *ICT as a resource* was not found to be statistically significant in the bivariate correlation with *job satisfaction*, it is significant in the regression model. Comparing the two relationships, however, *ICT as a demand* has a stronger association with *job satisfaction* than *ICT as a resource*. Finally, although none of the control variables were found to be statistically significant in the regression model, without their inclusion, the significant effects found would not be observed. Thus while not statistically significant, the control variables were still helpful.

Table 3: *Ordinary Least Squares Regression Predicting Job Satisfaction (N = 306)*

Variable	<i>B</i>	<i>SE B</i>	β
ICT as a resource	.034	.017	.131*
ICT as a demand	-.063	.016	-.253***
Sex	.048	.076	.038
Marital status	.050	.087	.034
Parental status	-.046	.080	-.036
Age	.002	.004	.044
Race	.134	.098	.079
Education	-.023	.033	-.041
Yearly income	.035	.026	.091
Hours worked/week	.001	.004	.020
Self-employed	.043	.115	.022
Frequency of computer use	-.001	.018	-.003
Frequency of work e-mail use	-.015	.020	-.048
Frequency of work text messaging	-.013	.033	-.023
Frequency of ICT use outside of work	.010	.006	.112
Adjusted R^2		.050	
<i>F</i> for model		2.078*	

* $p < .05$. ** $p < .01$. *** $p < .001$

Summary

Overall, the results from the statistical analysis suggest that when holding constant the control variables, professional employees' perceptions of *ICT as a resource* and *ICT as a demand* were both statistically significant predictors of *job satisfaction*. This provides support to both hypotheses proposed in this thesis. None of the other variables tested were significantly related to job satisfaction in either the bivariate or regression analyses. These findings lend support to the resources and demands model of work life (Voydanoff 2004a, 2004b).

The next and final chapter will include a more detailed discussion of these results along with study limitations and suggestions for future areas of research.

CHAPTER V

DISCUSSION

The role played by information and communication technologies in our everyday lives is constantly evolving and shaping our perceptions regarding the social world. Professional workers were the focus of this study because of their high rate of ICT use (Kakihara & Sørensen, 2002; Madden & Jones, 2008b; Victory & Cooper, 2002). The occupations held by professional employees often require at least some ICT use, if not a great deal of reliance on ICT, in order to complete work-related tasks (Hilpert, 2010). Past research has demonstrated a relationship between employees' objective use of ICT and job satisfaction (Colombier, et al., 2007; Danziger & Dunkle, 2005; Merten & Gloor, 2010; Messarra et al., 2011; Recascino, 2005). This study adds to the literature by focusing on subjective perceptions of ICT use among professional workers and job satisfaction. Data from the Pew Internet and American Life Project's 2008 Networked Workers Survey were used to examine the job satisfaction of professional employees who used ICT in the workplace. Hypotheses were framed using Voydanoff's (2004a, 2004b) differential salience theory, which suggests that elements of the workplace provide both resources and demands that may shape work-related outcomes, such as job satisfaction. In this study, ICT was measured as a workplace resource and as a workplace demand. This final chapter will first discuss the results outlined in Chapter 4. Implications for these results will then be proposed. Study limitations and suggestions for future research will follow.

Discussion of Results

The first hypothesis proposed in this study stated that when perceived as a workplace resource, ICT would be positively associated with job satisfaction for professional workers. This hypothesis was supported by the regression results and is consistent with the differential salience approach (Voydanoff 2004a, 2004b) that posits resources within the work domain as being associated with positive worker experiences, such as increased job satisfaction. This study extended Voydanoff's work by considering subjective perceptions of resources and demands, and focusing in particular on how ICT may act as a resource and demand. This finding is also consistent with studies by other researchers. Colombier, Martin, & Pénard (2007), for example, found that the use of various forms of ICT can have positive associations with job satisfaction if ICT systems are abundant and reliable. But while these authors focused on the objective use of ICT, this thesis examined perceptions of ICT as a resource and demand. By examining subjective perceptions, both the positive and negative aspects of ICT can be evaluated. The descriptive statistics from this study reveal that although professionals may use ICT and perceive strong demands related to that use, they also appreciate the benefits that make ICT a useful resource in the first place. The perception of ICT as a resource may decrease the demands professionals face in order to help allow them to be satisfied with their jobs. A simple example of this could be a company laptop allowing an employee to work from any convenient environment, not just the physical workplace.

The second hypothesis proposed in this study stated that when perceived as a workplace demand, ICT would be negatively associated with job satisfaction for professional workers. This hypothesis was supported by the regression analysis and by the bivariate

correlation. Thus, it appears that ICT can both serve as a useful resource, positively associated with feelings of job satisfaction, as well as a demand that is simultaneously, negatively associated with job satisfaction. In fact, although findings revealed a higher average report of ICT perceived as a resource than as a demand among these professional employees, ICT perceived as a demand was found to be a more highly significant predictor of job satisfaction. It is possible that after decades of integration into the professional workplace, the role of ICT may be more noticeable as a resource but when demands are perceived, they are more likely to have stronger (and negative) impacts on job satisfaction. Demands that cause problems outweighed the role of ICT as a resource in terms of job satisfaction for this sample. Typical demands associated with the use of ICT include working longer hours (Danziger & Dunkle, 2005) and work-related ICT interfering with personal life (Chesley, 2005; Colombier et al., 2007; Cooper & Kurland, 2002), both of which may help explain the linkage of ICT as a workplace demand to job satisfaction. Although past research, such as that reviewed earlier in this thesis, found an association between ICT use and job satisfaction, these variables were not significantly associated with job satisfaction in the current study. The use of computers, e-mail, and texting were not significant predictors of job satisfaction when perceptions of their use as demands and resources were considered. Thus, it appears that what is more important to reports of job satisfaction among professional workers is not the objective use of ICT, but how it is perceived in the workplace.

Implications

Overall, the use of ICT can have differing impacts on job satisfaction depending on the perceptions of professional employees. Perceptions of ICT as a workplace resource appear to be positively associated with job satisfaction whereas perceptions of ICT as a

workplace demand appear to be negatively associated with job satisfaction. Perceptions of ICT demands also have a slightly stronger relationship with job satisfaction than perceptions of ICT resources. An important implication that professional workplaces can take away from this study is to incorporate into company policy measures regarding ICT use that will best suit both employees and the company, maximizing resources and minimizing demands. By doing so, job satisfaction can be positively influenced, and as a result, employee performance and retention may also be improved. As mentioned in Chapter 1, Volkswagen has already made attempts to regulate ICT use by restricting the use of Blackberry e-mails by many of its employees outside of regular working hours (Cohen, 2012; Reuters, 2011). This policy both reinforces the use of ICT as a resource during regular work hours, and restricts its potential as a workplace demand by limiting off-work exposure. Employees were dissatisfied with the demands created by unrestricted work-related e-mails and now a more ICT-friendly policy is in effect. It may benefit other professional companies to explore similar policy changes, or at the very least, communicate with employees about how to maximize ICT-related resources and minimize ICT-related demands. If professional companies and employees take the time to analyze how employees perceive the technology they use, the impacts on job satisfaction may be improved with ICT upgrades, training exercises, or other improvements concerning the needs of employees.

This study made use of the differential salience approach. While Voydanoff (2004a, 2004b) focused largely on how resources and demands were related to elements of individuals' well-being, this study applied the theory to understand the relationship between perceptions of ICT as a resource and demand and job satisfaction. This contribution has practical implications for professional workplaces where ICT use and job satisfaction are real

issues. Research pertaining to how American professionals perceive ICT use in workplace and its relation to job satisfaction is quite limited. Thus it is a primary goal that the claims presented in this thesis may contribute useful information to the larger scholarly attempt to better understand job satisfaction and perceptions of ICT.

Limitations

This study attempts to bring forth a better understanding of the relationship between professional workers' perceptions of ICT and job satisfaction, but certain limitations should be acknowledged. This thesis focuses on professional employees. Professional employees are similar in many ways, but there are also differences among them. For example, a financial executive on Wall Street may self-identify as a professional employee, but so may a nurse in a small-town hospital, illustrating how the day-to-day responsibilities of professional workers can be incredibly diverse. Although it is useful to study professional employees as a single population, examining individuals within a specific occupation may prove to be equally useful for future researchers. This type of research could be conducted in order to gauge the effects of ICT use on any specific profession and that profession's employees.

A second major limitation for this thesis concerns the construct validity of job satisfaction. Many researchers have pointed out issues related to measuring job satisfaction (Evans, 1997; Mathieu & Farr, 1991; Saane, Sluiter, Verbeek, & Frings-Dresen, 2003). Their concerns are largely due to the subjectivity and ambiguity of the measurement. What "satisfied" means to one employee does not always mean the same thing to another. Furthermore, the use of a single-item measure to gauge job satisfaction in this thesis is less reliable than a multi-item measure (Rose, 2001).

A third limitation is this study's inability to incorporate other work-related variables that have been shown to be associated with job satisfaction. Work-family conflict, job autonomy, responsibility, recognition, and advancement (Hackman & Oldham, 1976; Herzberg, 1966) were not measured in the Networked Workers Survey and thus could not be considered as part of the study model. The inclusion of these important variables would provide a more comprehensive view of job satisfaction and when controlled for, would allow for a more precise approximation of the impact of perceptions of ICT on job satisfaction.

Finally, while both hypotheses of this study were supported, the directionality of the relationships between perceptions of ICT and job satisfaction can be called into question. For example, while it was found that the perception of ICT as a resource was positively associated with job satisfaction, it could be the case that it is not the perception of ICT as a resource that causes job satisfaction to increase. Rather, employees with high job satisfaction could be more likely to perceive ICT as a resource. This is also applies for the negative relationship between perceptions of ICT as a demand and job satisfaction. Perhaps those who are dissatisfied with their jobs are more likely to view ICT as a demand. In other words, dissatisfied workers may view ICT more negatively, whereas satisfied workers may be more likely to view ICT as a resource.

Suggestions for Future Research

Future research may benefit from a stronger focus on more specific aspects of ICT use in the workplace. This could include questions regarding the type of work carried out with ICT. The programs and applications used on computers, exact records of time spent using e-mail and telephones for all work purposes, and total hours per week using work-related ICT could all help further detail the relationship between ICT and job satisfaction.

Specific questions that directly ask which forms of ICT professional employees perceive to be resources and demands could also fulfill this purpose. For instance, as indicated by past authors (Colombier, et al., 2007; Danziger & Dunkle, 2005), the presence of up-to-date technology and dependable tech-support are associated with reports of job satisfaction. By further examining specific forms of ICT, the more general association between ICT and job satisfaction can be better understood.

Future research may also benefit by utilizing different research methods other than quantitative surveys. Because technology continues to advance at a rapid pace, employees may have experiences with ICT that surveys or other quantitative methods may not fully capture. A completed survey, for instance, may become quickly outdated with the emergence of new technologies. By utilizing a qualitative approach, it may be possible for researchers to attain detailed accounts of how different forms of ICT are perceived as resources and demands. This approach may also provide more detailed accounts of the subjective perceptions employees have concerning ICT. For instance, the use of time diaries may provide researchers more specific information about when or where professional employees use ICT and how they perceive its use relative to that time or place. Finally, focusing on professional employees within a single occupation may also be useful. By examining employees within a specified profession, employers could then use that research to address the specific needs of their employees and how to best to improve perceptions of ICT. Several studies have already utilized this approach (Bos et al., 2009; Cooper & Kurland, 2002; Freund, 2005; Kim & Wright, 2007; Reid, Riemenschneider, Allen, & Armstrong, 2008; Scott et al., 2005), but future research would also yield valuable information.

Conclusion

This study used the differential salience approach to explore the relationship between professional employees' perceptions of ICT as a resource and demand and reports of job satisfaction. An overview of existing literature pertaining to this topic was reviewed and data from the Pew Internet & American Life Project's 2008 Networked Workers Survey were used to assess study hypotheses. Results indicated that employee perceptions of ICT as a workplace resource were positively associated with job satisfaction, whereas perceptions of ICT as a workplace demand were negatively associated with job satisfaction for professional workers. While this study made a contribution to the literature on job satisfaction, future research is recommended to gain a more in-depth understanding of how information and communications technologies shape the work lives of professional employees.

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